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EDITORIAL DEPARTMENT NOTE

There is little need to emphasize the importance at the present time of the subject of accelerated depreciation. With both industrial operations and tax rates at new highs, industrial accountants are giving thoughtful consideration to the effect of increased activity on depreciation rates and the effect of depreciation policies on taxable income. The treatment of this subject in Victor Stempf's article in this issue of the *Bulletin* will be of interest to every industrial accountant.

In the pressure of dealing with the many urgent present-day problems, the industrial accountant needs to be watchful that he does not lose his perspective and his understanding of the uses made of his cost figures and the need for adapting the figures to the particular uses to which they are put. In this respect Wyman Fiske's article on "The Nature of Cost and Its Uses" is most timely, providing a broad view of the cost field and the uses made of the various cost concepts. We commend it to you for careful study.

The authors of these two articles are so well and favorably known to all N.A.C.A. members and have contributed so frequently to N.A.C.A. publications in the past as to need no introduction. Just to refresh your memory, Mr. Stempf, Partner of Touche, Niven & Co. of New York, was last year's National President. He has also served as President of the New York State Society of C.P.A.'s and has been most active in various committees of the American Institute of Accountants. In addition to his contribution to the operation of these accounting associations, Mr. Stempf has been a frequent speaker before meetings of accountants and has contributed generously to the literature of accounting.

Professor Fiske, again to refresh your memory, is Professor of Accounting and Director of the Sponsored Fellowship Program at the Massachusetts Institute of Technology. His election as National Vice President of N.A.C.A. last June followed many years of service to the Association, including a three-year term as Director in charge of Publications and service as chairman and as member of two convention technical program committees. Like Mr. Stempf, Professor Fiske has been a frequent speaker at accounting meetings and has contributed extensively to accounting literature.

Articles published in the *Bulletin* present many different viewpoints. In publishing them the Association is not sponsoring the views expressed, but is endeavoring to provide for its members material which will be helpful and stimulating. Constructive comments are welcomed and will be published in the Forum Section of the *Bulletin*.

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MARCH 15, 1942

ACCELERATED DEPRECIATION

By Victor H. Stempf, Partner,
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THE EXCEPTIONAL activity of the war emergency, with its pressing and perplexing problems of government contracts, priorities, price control, taxation, and constant revision of estimates, forecasts, and government reports, makes one pause in admiration of the self-confident restraint and persistent diligence of industrial accountants, who manage somehow to maintain a perilous equilibrium best expressed in mixed metaphor as "keeping their heads above water and their ears to the ground."

Although not as important as many other immediate problems, that of accelerated depreciation impinges vitally upon the sound determination of income, and affects the pocketbook of every business through its relation to income taxation. No accounting officer can ignore the question; it may afford material tax savings; it may alter vitally the cost justification in government contracts.

Area to be Covered

The present discussion may be of value primarily in defining the problem, in discussing the basic reasons for acceleration, in describing other avenues of tax savings through modification of depreciation, and in discussing the broad economic implications of depreciation; thereby suggesting the manner in which the subject may be approached and studied for the purpose of reaching a deliberate and informed conclusion as to its applicability in any case. Much of value has been written on the subject in recent months. The *N. A. C. A. 1941 Year Book* has a section devoted to it; an excellent historical resume of related tax cases which arose during the last war appears in the proceedings of the convention of the American Institute of Accountants in 1941, and the *N. A. C. A. Bulletins* of the last six months include a number of articles dealing with war amortization and depreciation generally. Incidental reference material will be mentioned subsequently.

Definitions

Accounting concepts of depreciation and amortization of fixed assets differ in some measure from economic, engineering and legal

viewpoints. The economic and legal views usually stress the "value" aspect—replacement cost, unrealized appreciation and utility; the engineering view is prone to overemphasize the factor of relative mechanical efficiency; whereas the accounting concept restricts the terms to the expiration of the acquisition cost of fixed assets in the course of business operation—regarding all expenditures for fixed assets as deferred charges applicable to periods, or production, which will benefit from the use of such facilities. In this respect, federal income taxation has been consistent since inception; acquisition cost or March 1, 1913 value fixes the basis for depreciation. However, from the standpoint of depreciation rates, the Bureau obviously views depreciation as a "gift" to the taxpayer; one of several allowable deductions granted by the grace of Congress, to be held to an irreducible minimum.

The startling significance of depreciation in our national economy is dramatically presented in a study published by the National Bureau of Economic Research, stating that out of a total "erosion of capital facilities" of eight billion dollars per annum, over five billion represents depreciation. Important though depreciation is in the fair determination of earnings, the most vital consideration is that of taxation which has become such a huge burden upon business. If corporations fall afoul of tax limitations, the result may be disastrous.

The Cost Concept

The accountant's concept of depreciation related to cost has been described excellently in the "Statement of Accounting Principles" promulgated by the American Accounting Association in June, 1941:

> "Factors of production and other resources of an enterprise are measured at the date of acquisition by costs incurred or amounts invested, on a cash or cash-equivalent basis, and at later dates by the balances of costs incurred or amounts invested after taking into account the effects of operation and other subsequent events. * * * For each accounting period there must be a determination of the amount of cost which has been absorbed in producing revenue or has otherwise expired, and also the amount of cost which is reasonably applicable to future operations. * * * In the case of

depreciable or amortizable resources the minimum requirement is that the cost of each asset be spread as uniformly as possible over its productive life."

The Tax Aspect

Since inception, the federal income tax laws, have permitted a reasonable allowance for the exhaustion, wear and tear of property used in trade or business. The controlling Treasury Decision governing the method of computing depreciation, effective today, was issued in February, 1934 as T.D. 4422; it provided:

> "The capital sum to be recovered shall be charged off over the useful life of the property, either in equal annual instalments or in accordance with any other recognized trade practice such as an apportionment of the capital sum over units of production. Whatever plan or method of apportionment is adopted must be reasonable and *must have due regard to operating conditions during the taxable period.* The reasonableness of any claim for depreciation shall be determined upon the conditions known to exist at the end of the period for which the return is made. Where the cost or other basis of the property has been recovered through depreciation or other allowance no further deduction for depreciation shall be allowed. The deduction for depreciation in respect of any depreciable property for any taxable year shall be limited to such ratable amount as may reasonably be considered necessary to recover during the remaining useful life of the property, the unrecovered cost or other basis. The burden of proof will rest upon the taxpayer to sustain the deduction claimed. Therefore, the taxpayer must furnish full and complete information with respect to the cost or other basis of the assets in respect of which depreciation is claimed; their age, condition and remaining useful life; the portion of their cost or other basis which has been recovered through depreciation allowances for prior taxable years; and such other information as the Commissioner may require in substantiation of the deduction claimed."

These principles have been retained in Regulations 103, now governing depreciation allowances, plus definite deference to current

maintenance as a factor affecting depreciation, and with the warning that obsolescence induced by economic conditions, clearly shown by the taxpayer as necessitating retirement of property at a future date before the end of its normal useful life, may be allowed; but such deduction will not be permitted solely on the basis of the taxpayer's opinion; it must be supported by credible evidence.

No accountant can quarrel with the soundness of the theory written into T.D. 4422. In practice, however, every one knows that the attitude of examiners has always been, as previously stated, to reduce depreciation allowances to an irreducible minimum.

Background of T.D. 4422

T.D. 4422 was conceived as a revenue expedient in lieu of an arbitrary reduction by twenty-five per cent of the allowance for depreciation and depletion initially advocated by the House Ways and Means Committee early in 1934. Theretofore, although taxpayers had to sustain the deduction taken, such deductions were difficult to challenge, and the Bureau had to assume the burden of having exhaustive schedules prepared by field agents, in an endeavor to show by "clear and convincing evidence" that deductions were unreasonable. These administrative difficulties were overcome by T.D. 4422, amending the regulations to place the burden of proof squarely on taxpayers, and by the related promulgation of mimeograph 4170 setting forth the character of detailed information which the Bureau might require taxpayers to prepare. In many cases compliance with mimeograph 4170 was not demanded. As those may attest who were called upon to file the schedules required by mimeograph 4170, or to defend cases under T.D. 4422, the major difficulty lies in the fact that relatively few companies have introduced and maintained plant records which are sufficiently detailed to lend themselves to ready analysis or convincing summarization. The N. A. C. A. research study released in the *Bulletin* of April 15, 1941 disclosed amazing differences in practice, inconsistencies and disregard of elementary principles.

The Evolution of Depreciation Practice

The fact is that there is a constant and basic conflict between the views of management and accountants. Successful management is deliberately conservative, practical, and opportunistic, often at the

obvious sacrifice of consistency. It is almost thirty years since the federal income tax was enacted. Prior thereto and for some years thereafter, the prevailing attitude of management, if it recognized depreciation at all, was to provide for depreciation on a completely arbitrary basis; liberal in years of profit, and meager or none in years of loss. Accountants were in large measure responsible for the introduction of tax provisions requiring regular provisions for depreciation, consistent with the principle that depreciation is a cost incurred regardless of earnings. Strangely enough, it may be argued from the *cost-concept* that accounting for depreciation should be solely a matter of spreading investment cost against revenue, in years in which such revenue is earned through profitable production. No practical accountant denies that depreciation is more reasonably related to *use* of facilities than to *time,* and the reconciliation of the views of management and accountants has found expression in the adoption of production unit methods giving effect to differing annual changes for depreciation in relation to activity.

Accelerated Depreciation

Claiming accelerated depreciation under the principles of T.D. 4422 is the most natural and responsive manner of accomplishing that purpose, provided the taxpayer is prepared to support the claim by something more than "hot air." There must be reasonable evidence of change in "operating conditions during the taxable period." A demand for increased allowance for depreciation may forstall an attack on existing rates, but such claims should not be made hastily or blindly; they may prove to be a boomerang. The claim may precipitate an exhaustive examination of depreciation rates and practices by the Bureau, bent on reducing allowances, and culminating in unforeseen demands for exhaustive analyses of records. Liberal expenditures for maintenance in the immediate past are viewed by the Bureau as a factor which retards depreciation, and this argument may be used effectively by the government in rebutting a plea for additional allowance. Likewise one finds in some cases that lower depreciation has been taken voluntarily by the taxpayer in a preceding loss year, thereby, perhaps, estopping or weakening a plea for increased allowance in an ensuing profitable year. It may be better to let sleeping dogs lie.

It is a foregone conclusion that no taxpayer will get additional depreciation without asserting the right; it is also to be expected that the claim will be challenged. The industrial accountant must answer several questions first to his own satisfaction: "Are the reasons and arguments available both credible and persuasive; and are my records in such shape and such detail as to support the contention?" It may be feebly argued that "comparatives" should lend full justification. "Elsewhere in the industry there are directly analogous situations where higher rates are granted, fully supporting the claim." It is to be feared that such casual argument would fall on deaf ears. It is entirely reasonable that each case should stand or fall on its own merit.

Back of the claim, the taxpayer should be well fortified with ammunition to defend his position: considered statements of production superintendents and plant engineers, methods supervisors and employment managers relating to changes in production methods, practices, and personnel, with supporting statistical data dealing with comparative hours of use of equipment, and related production, maintenance data in dollars, man hours and units of material, and similar evidence. Mr. A. B. Hossack, a distinguished appraisal engineer who is well known as a speaker in our chapters, recently said:

> "The extent of the effect of acceleration on the ultimate retirement may be the subject of honest differences of opinion. It will certainly be the subject of tax controversies. If acceleration is to be claimed, all factual data should be assembled at the time to avoid litigation and trying to build a case later, when facts are more difficult to analyze."

Unit Control Records

Those who have adequate supporting detail, particularly in the form of unit control, should have less difficulty in determining pertinent justification for accelerated depreciation. For purposes of interpreting the history of equipment; as an aid in forecasting life expectancy under various levels and conditions of activity; for the control of maintenance, replacements and insurance, as well as the justification of depreciation rates, unit control records are almost indispensable; in fact, for the control of the very existence and possession of property, they are essential. The epitome of what may be done with such historical detailed data was exempli-

fied in an absorbingly interesting, thorough, and scientific review presented by Messrs. Crunden and Belcher of the American Telephone & Telegraph Co. at the International Accounting Congress held in New York in 1929, concerning the justification of straight-line depreciation practices of telephone companies. The study embodied factual material and analyses of plant investment, maintenance and retirement, predictable causes and kinds of depreciation, plant characteristics affected, and illustrative cases and mortality tables. The proceedings of that Congress may be found in any technical library; a perusal of the article will repay anyone confronted with the problem of similar research.

Causes of Accelerated Depreciation

The decisions of the Board of Tax Appeals are replete with cases dealing with accelerated depreciation, both favorable and adverse, which grew out of the last war. These serve as very informative background for the preparation of evidence supporting a taxpayer's claims for accelerated depreciation. In some cases the testimony was adequately and convincingly presented; in others it seemed mere allegation without supporting evidence. The persuasiveness of the testimony, obviously, depends upon the credibility of the facts disclosed by records and the skill in presentation.

The following significant causes justifying accelerated depreciation may be gleaned from a review of the B.T.A. decisions:

OVERTIME

Long continuous use brings into play a factor of diminishing efficiency. As the human machine needs rest, food and rehabilitation, so does the inert machine need a period to cool-off, to be cleaned, oiled and refreshed, if not repaired. Continued use beyond normal periods hastens deterioration. The fatigue of the worker puts added strain, if not abuse, upon some types of machine tools.

ADDED SHIFTS

Clean-up and inspection routine may prevent in part the damage otherwise attributable to multiple shifts, but if one may draw a homely analogy from the use of the family car, it does take some planning to see that tires, oil, battery and minor adjustments are properly watched when two or more

drive the same car; and no two ever use or abuse a car in like manner.

HIGHER-SPEED AND NEW MATERIALS

The cruising speed of commercial planes is set for maximum efficiency and economy of operation. Intricate machine tools, likewise capable of higher speeds and reasonable adaptability to similar materials, are designed for "cruising speeds" and normal loads. More efficient cutting tools of harder steel permit higher speeds and increased production, at the cost of abnormal strain and increased exhaustion of machines, intensified by the substitution of more difficult materials.

DEFERRED MAINTENANCE

While every effort may be made to continue and improve normal maintenance, constant operation makes this increasingly difficult; both hours and other costs of maintenance may indicate normal relations, but may entail greater difficulty and less efficiency, thereby affecting useful life.

PERSONNEL AND MAKE-SHIFT MAINTENANCE

New and less skilled workers abuse equipment; this applies equally to operation, maintenance, and inspection of equipment. Increasing scarcity of repair parts and materials, and substitution of "home-made" parts and new materials add further strain and accelerate deterioration.

N. A. C. A. Questionnaire

In December, 1940, N. A. C. A. issued a questionnaire concerning current depreciation practice, including a question on acceleration, in which the following definitions was offered:

> "By accelerated deprecation is meant a blanket increase in rates during a period of abnormal activity to take care of additional wear and tear occasioned by more than normal usage of equipment. It should be distinguished from adjustments of rates resulting from a review of estimated remaining life as required by T.D. 4422."

Why should it be distinguished from the adjustment of rates resulting from the application of T.D. 4422? Wherein does the ad-

justment of rates under any theory of accelerated depreciation differ from the concept of T.D. 4422 that "any claim for depreciation should be determined upon the conditions known to exist at the end of the period for which the return is made"? "A blanket increase" in rates is merely a rule-of-thumb attempt to give expression to the effect of existing conditions.

The N. A. C. A. research study pointed out that the production volume basis automatically effects an acceleration of depreciation, in contrast to the use of ordinary straight-line methods. It is true, also, that a scientific application of T.D. 4422 affords the basis for equivalent acceleration. The distinction is essentially one of form, not one of principle.

Production Unit Depreciation

In common practice, the production volume basis is merely straight-line depreciation translated into terms of units produced. It takes various forms. It may be tied to unit control, recognizing clearly varying estimated life factors of the component elements of an individual machine, such as a separate life for the motor as distinguished from the life of the machine to which it is attached, or the separate rate applicable to linings as distinguished from the furnaces of which they are a part. It may be based upon group depreciation, contemplating the average life of like machines in a production center; or it may be related to composite straight-line rates applied to a few classifications of plant and equipment, the component elements of which may have widely divergent lives. In some cases, all three variants of straight-line or production unit depreciation may be in use. A department and the building in which it is housed may be an integral unit justifying an overall composite rate; another department or plant may be of such character as to require some differentiation by groups, and perhaps further refinement on a unit control basis within certain groups, and finally the situation may be such as to warrant complete unit control. Sometimes it may be found that the methods used are quite inappropriate, due to ignorance, inertia or indifference; in other cases the methods may be the result of careful study and deliberate selection on grounds of justifiable prudent economy. Each case is a separate problem.

The soundest production unit methods evolve after long use of straight-line depreciation in periods of normal and abnormal activity, during which engineering data, abandonment records and other life-expectancy history have been recorded as a basis for the determination of scientific production unit rates. In such cases, one has credible data upon which to rely. In other cases, production unit depreciation may be adopted in a young company abruptly thrust into a period of subnormal activity where the motivation is obviously to relieve current earnings. In such cases, it seems, the minimum provision should be measured against accrued straight-line depreciation. In some instances, production unit depreciation is applied on the basis of a formula which sets an inflexible, standard depreciation charge representing say 75 or 80 per cent of straight-line depreciation, modified by a volume factor designed to absorb part or all of the remaining 20 or 25 per cent of straight-line depreciation. This method contemplates the absorption of 100 per cent of straight-line depreciation at normal capacity, and more than the full quota of straight-line depreciation at levels of production above normal capacity.

It is possible in many cases where there is grave doubt as to the availability of data to support an outright claim for accelerated depreciation, that a change to production unit methods may be accomplished with greater ease, for it is basically a translation of existing accredited straight-line rates into terms of units of product, concerning which every company has adequate historical detail, though it may not have adequately detailed and classified records of depreciation experience.

Accelerated depreciation affords a legitimate basis for minimizing taxes. It may be unavailable to some; it may be too difficult to support in other cases; its possibilities should certainly be studied.

Another avenue toward greater depreciation allowance should not be overlooked. In many cases, companies continued liberal depreciation deductions for corporate purposes during the loss years of the depression. These provisions were often in excess of those approved by the Bureau of Internal Revenue. There is now reasonable expectation that depreciation deductions disallowed in profit years, and deductions taken in loss years beyond amounts allowable, may be restored to the base available for subsequent depreciation deductions for tax purposes.

The Pittsburgh Brewing Case

The Circuit Court of Appeals for the Third District rendered an opinion in November, 1939, reversing the Board of Tax Appeals, on the sole question of whether depreciation claimed by the taxpayer (Pittsburgh Brewing Company) in its tax returns in amounts in excess of those legally allowable, were "allowed" within the meaning of Section 113(b)(I)(B) of the 1932 Act, although no taxable income was offset thereby. Its decision held that depreciation is not "allowed" unless actually taken as a deduction against income. In other words, to the extent that the taxpayer took depreciation in excess of the amount allowable, such excess did not constitute a reduction of the remaining base. The case related to the determination of taxable gain or loss upon disposition of property. Nevertheless, the reasoning also flows naturally to the determination of the appropriate base for subsequent depreciation.

In the Beckridge case, in September, 1941, the Board of Tax Appeals decided a related issue in which the taxpayer deducted no depreciation whatever although some depreciation was incurred. This case also related to gain or loss on disposition of property. Here the B. T. A. followed the precedent of the Hardwick case where the Circuit Court of Appeals for the Second District said:

> "The amount of the depreciation must be deducted from the original cost of the whole in order to determine the cost of that disposed of in the final sale of properties."

In this case the distinction lies between depreciation allowable, had the taxpayer had earnings, as opposed to depreciation in excess of that allowable in the Pittsburgh Brewing case, where it was held that even though the taxpayer deducted it, it was not beneficially "allowed" for tax purposes because there were no profits against which to charge it.

In January, 1942, in the Kennedy case, the B. T. A. held that where depreciation had been deducted in excess of that allowable, and in error, in years of loss, the excess was restorable to the base for depreciation to be deducted in later years, thereby sustaining the point that the principle relates both to base for subsequent depreciation and to the base for determination of gain or loss on

disposition. It is to be noted that out of a panel of sixteen, there were four dissenting votes among the members of the B. T. A. in this case, and all of the ramifications of the problem are not yet fully cleared.

It seems that the B. T. A. position may be summarized to be that depreciation allowable must be deducted whether there are earnings or not; that depreciation taken and allowed in profitable years in excess of that allowable may not be added back to the base for either the purpose of subsequent depreciation or determination of gain or loss on disposition; but that depreciation taken in loss years in excess of that allowable may be added back to the base for either purpose.

The Commissioner of Internal Revenue has refused consistently to recognize the principle at all in cases involving depletion as distinguished from depreciation, and as indicated in Pittsburgh Brewing, Beckridge and Kennedy cases have forced cases to the Board where there were distinctions which could be fought.

Where some part of depreciation claimed has been disallowed in profitable years, but the same rates were continued in subsequent loss years; or in cases where rates used in loss years have been disallowed in subsequent profitable years, the aforementioned principle should be invoked to claim a higher depreciation base (and perhaps a higher invested capital base) in subsequent profitable years.

War Amortization

This subject, which is an intricate study in itself, takes on a new aspect at present, due to the repeal of the troublesome, if not insoluble, Section 124(i) of the Internal Revenue Code dealing with non-reimbursement certificates. Time does not permit a review of the history of the difficulties reared by this Section. The basic provision of Section 124, providing an option of five-year amortization for new defense facilities in lieu of normal depreciation for tax purposes, remains in effect, and it is understood that certificates of necessity requisite to its use by taxpayers will be issued upon proper showing of the need for added facilities. In passing it is interesting to observe that T.D. 5000, which governs allowable costs in war contracts involving a cost justification, provides:

> "In making allowance for depreciation, consideration shall be given to the number and length of shifts."

This is a recognition of the principle of accelerated depreciation in the determination of costs in war contracts, as distinguished from allowable deductions for federal income tax purposes. While there is no statutory provision or regulation covering the matter, it is not unlikely that bases of acceleration accepted for one purpose will have some bearing upon that allowed for the other purpose, although it is possible that in final settlements they may differ widely.

Economic Aspects of Depreciation

As a concluding phase of this discussion, it is fitting to consider briefly the elementary economic implications of depreciation: Why do business and Government persist in doing things as they do?

During prosperous periods, business improves facilities, catches up on deferred maintenance, extends plant and replaces equipment, because there are profits to bear the costs of rehabilitation, and these costs in large measure become tax deductions. In periods of recession, there is every inducement to do the reverse; profits are meager or there are losses; increased expenditures for maintenance or increased depreciation on new equipment simply add to the loss without being beneficially allowed taxwise. If the processes could be reversed, a material contribution would be made toward solving the problem of economic instability, and toward mitigating the unemployment which inevitably arises in times of recession.

The federal policy of curtailing depreciation is near-sighted, i.e. inconsistent with economic logic, and contrary to the long-range interests of the Treasury. Even the driving need for revenue to finance war expenditures does not excuse the selection of unsound, although politically expedient, bases of taxation. This smacks of the ancient practice of continuous shifting of the burden to those who squawk least until the full impact is discerned. True statesmanship demands fearless determination of fixed policies of taxation, consistent with economic laws, and the adjustment of rates to meet revenue needs. Business can adjust itself to high

taxation based on stable principles which are understood, but constant change in the form and incidence of taxation is devastating in its effect upon business, and induces indecision, speculation and paralysis.

Sweden, and several of the other European countries, before the present war, had adopted policies of "free depreciation" not only on machinery but also on inventories, leaving the discretion wholly with management as to how much should be deducted both for book and tax purposes, thereby establishing a rational connection between taxation and business conduct, stabilizing earnings and tax revenues. Enlightened management rarely justifies large investments in new machinery unless it foresees recovery of the investment through profitable operations within a period of two or three years. It is a maxim of sound industrial management that "money invested in modern tools earns more than when invested in securities." Good management is eager to accelerate the amortization of investment in machinery to keep pace with the constant improvement in technology, but can ill afford to replace less effective tools with modern equipment if substantial balances remain unamortized.

Depreciation Does Not Provide New Funds

The T.N.E.C. hearings, several years ago, concluded erroneously that industry had accumulated vast cushions of working capital through overly liberal provisions for depreciation. Stuart Chase supported this conclusion in his book *Idle Money, Idle Men*. Every accountant knows that whatever form or speed of depreciation may be applied, depreciation does not provide new funds, it is essentially a recovery of investment previously made in facilities. Many years ago, a published study of depreciation practice made the statement that: "Obsolescence has discarded more fixed assets than wear and tear." Constant pressure to ignore the factor of obsolescence has resulted, generally speaking, in provisions for depreciation which have been far too low. Every one should review the scholarly study conducted by Professor Hosmer of Harvard, published in the *Accounting Review* of March, 1938, relating to corrections of under-depreciation. His strongest case was that of U. S. Steel, amounting to some two-hundred-seventy millions in 1935, explained in the published report as follows:

> "Broadly these adjustments are attributable to the developments in the art and mechanics of steel making, which have operated to reduce the normally expected life of such facilities, and to changes in plant location based upon shifting markets and transportation facilities."

The great problem of excess facilities which arose after the last war was in no small part created by the failure to discern the need for accelerated amortization of facilities provided specifically for war production. This problem was recognized quickly by industry at the beginning of the present war; wisely, provision has been made for special amortization of such facilities within the war period.

Long-Range Importance of Liberal Depreciation Allowances

Increased depreciation allowances in prosperous times, coupled with some type of contractual funding, in an amount equivalent to the depreciation, to be used in loss years for replacements and improvements, would meet the long-range economic problem squarely. Likewise, liberalized and extended loss carry-overs, at least to the extent that such losses include "depreciation allowable," would also approach the problem intelligently. Industrial activity will be stimulated to the extent that it can be made worth while for business to make expenditures in lean years (measured from the standpoint of taxes which it has to pay), and unemployment will thereby be relieved. This should not be misconstrued as championing any form of incentive taxation. Carry-over provisions are merely proper recognition of the cyclical character of business, and are equitable as opposed to formulae which recognize only the single taxable year. Certain it is, that scant cognizance has been taken of the importance of depreciation in our federal tax system. Legislators and the Treasury do not realize that depreciation is one of the most important factors in industrial operations, affecting our entire national economy. Those who have influence in the presentation of data to the Treasury Department, the House Ways and Means Committee and the Senate Finance Committee, through professional or trade bodies, or otherwise, would do well to foster stronger emphasis upon the long-range importance of liberal depreciation allowances.

THE NATURE OF COST AND ITS USES

By Wyman P. Fiske, Professor of Accounting, and Director, Sponsored Fellowship Program, Massachusetts Institute of Technology, Boston, Mass.

THERE is a New York real estate enterprise which, having gone through financial reorganization, operates under a bond indenture of more than passing interest to accountants. This indenture defines to a considerable extent what shall be included in cost of operations, at least for the purpose of determining the balance available for interest payments. I am sure many will be shocked at some of the elements in the definition: (1) taxes are to be included only as paid; (2) expenses of alteration to meet tenants' needs and rental commissions are costs of the year in which they are made, regardless of the term of the lease; (3) depreciation is not to be included as cost; (4) most building improvements are to be treated as costs, not capital charges; and (5) additions to working capital (within defined limits) may be deducted as costs.

Since this enterprise is a service organization there are no inventories, save minor ones of supplies. By subtracting costs of operations, which include the elements described above, from rentals received, profits before and after interest on bonds are determined. If this is good accounting, what do we mean by profits? By costs?

The only way such an accounting approach can be rationalized and defended is by recognizing the unusual problem faced by those drafting that indenture. And it was an unusual problem. The business had failed and the bondholders dictated the reorganization. A small interest charge was fixed; the balance was an income charge payable only if "earned." Their problem was in effect to find means for determining the amount of cash which could safely be disbursed as interest payments and as a sinking fund for retirement of some of the bonds. The continuity of the business must be protected, but the bondholders determined to use the maximum possible funds for interest and the retirement

of at least a portion of the bonds outstanding. Costs and profits had very special meanings for them. I wouldn't advise their principles for general use. I do think they took a practical approach to a practical problem.

This real estate illustration represents an unusual and admittedly extreme situation. Nevertheless it does point to the importance of recognizing that cost analysis has more than a single objective. If it had but one, our jobs would be far simpler. While the industrial cost analyst is always concerned with the accumulation and detailed analysis of factory, marketing and administrative costs and expenses to provide facts needed by operating executives, the uses of the facts vary so widely as to constitute differing objectives. As a consequence we as accountants may be called upon to study the same transactions from several different angles, and we may arrive at conclusions which, if the differing objectives are not accepted, appear to be quite inconsistent.

A. Nature of Cost Concept

It would greatly simplify a discussion of "The Nature of Cost and Its Uses" if it were possible to offer as a jumping-off point a clear-cut definition of cost. Unfortunately, even a single definition is impossible, much less one that is unequivocal and clear-cut. The term has many different meanings with only an extremely indefinite unifying idea of "sacrifice" to justify its application to such widely varying ideas. Several concepts have practical business import and are recognized in specific business problems.

Cost, with its underlying idea of sacrifice to acquire something, is a concept of wide application. The explanation for the diversity of connotations lies in a heterogeneity of points of view and in the wide variety of uses of cost figures by those concerned with questions of cost. The term has social, ethical, economic and business implications. A sociologist will consider technological unemployment and changes in standards of living as costs to be considered in a social decision as to the encouragement or prohibition of a specific proposal. Sacrifice of moral principles would appear to any clergyman as an undesirable cost of material plenty.

The economist commonly considers interest as a cost of production but excludes rent in the economic sense—attitudes which are just the reverse of those ordinarily taken by business men.

We are naturally concerned with business concepts of costs. If you don't think there are many varieties, look in the index of a few cost treatises. Only a brief study developed the list shown opposite. Any attempt at classification of the items on this list would reveal that some are subdivisions of general terms, but that at least some of the general items represent distinctly different approaches and cannot be reconciled with others. Brief consideration of four contrasting groups of concepts is worth while.

I. Outlay versus Non-Outlay Costs

Although actual outlay or investment is the backbone of the ordinary financial approach to cost, this is not always the case. There are cases where accountants depart from this concept in both directions; cases where items which have never involved outlay are treated as costs; and cases where they depart from an outlay actually made. One needs only to point out the infrequent but nevertheless important occasional writedowns of productive plant because of price changes. In such an event all subsequent depreciation charges have only a casual connection with actual outlay. There are also the reverse cases of recognition of newly discovered mineral deposits not recognized in the original purchase price. To the extent that cost estimating is considered a branch of cost analysis it illustrates everyday use of inclusion of cost items which are not and cannot be based on outlay for the simple reason that the project is still in the planning stage.

Thus we see that some costs represent financial outlays and some are just figures used because they are the only ones available or because they seem more useful than actual outlays.

II. Prorated versus Differential Costs

The simplest cost problem which can be conceived of is that of determining the cost of a single product produced by an organization set up to make it and nothing else. Unfortunately, it is practically non-existent. The usual experience is quite dissimilar. Multiple products are the rule, and multiple products carry with them two production problems which create many of our cost problems. An appreciable portion of all production is joint pro-

Costs

actual
administrative
assembly
average
bank
budget
by-products
class
collection
construction
continuous
controllable
conversion
cumulative
departmental
depreciation
development
differential
direct
distribution
economic
engineering
equipment
estimated
excess
factory
fixed
formula
functional
group
handling
historical
indirect
job, job order
joint
labor
  direct labor
  indirect labor
maintenance
manufacturing
marginal
material
  direct material
  indirect material
net
normal
operating, operation
opportunity
overhead
plant
power
prime
process
product, production, producing
purchasing
rate setting
removal
reproduction
safety
selling
service
shipping
specification (estimate)
standard
storage
storeskeeping
sunk
supervision
supplementary
time study
total
transferred
trial
true
ultimate
uniform
unit
unit-product
variable

duction, and all business operations involve joint use of facilities and organization. The first produces joint-cost problems, and the latter requires some method of apportionment of indirect costs among the several products benefiting. There are two approaches: proration and differential costs.

Proration is the usual attack in cost routines carried through the accounts. A consideration of methods or bases for proration is not relevant to this discussion. Suffice it to say that bases vary from the admittedly arbitrary devices used in prorating joint-production costs to bases for prorating manufacturing expenses which are either essentially arbitrary or logical according to whether one accepts as universally true the assumptions underlying the basis. All attempt to measure the benefit received by each product. The pragmatic test of usefulness of the results is, in my opinion, the final test. But arbitrary or logical proration is universal and unavoidable either upon the general basis of benefit received or upon a differential cost approach.

One of the amazing characteristics of differential costs is that you can get so many different costs for each product simply by varying the order of elimination. It is an algebraic problem of permutations and combinations. The approach is to assume the dropping of the products one by one and determine the cost items eliminated by the action. Only the actual decrease which would result from dropping an item is considered as the cost attributable to that item. The last item dropped, if we assume the business is closed up, is always the highest cost item. Obviously the basic assumption of differential costs is in direct conflict with the proration ordinarily followed in our cost routines. No wonder the use of differential costs has raised heated arguments. But the really important thing is that we all use them nevertheless.

III. Actual versus Normal and Standard Costs

Most of us recognize that the concept of actual cost is practically unattainable under modern complex production methods and with so many cost elements purchased in quantities which frequently represent years of service. Yet the idea persists. Government contracts call for computation of cost by applying only current outlays to current production. There are still many businesses which use this approach, denying the idea of normals.

Normal costs, though not universal, represent the most widely accepted approach to interim costs. The concept is, in effect, that where cost commitments are made for considerable periods in advance and where productive activity varies from season to season and year to year the best cost is one that prorates the longer-term costs in proportion to production rather than on a time basis. Unfortunately, the concept is not always followed consistently. When the level of production is below normal, the cost figures resulting from using normal costs in prorating burden are used for inventory purposes; but when the level is above normal, the over-absorption resulting is used in part to reduce inventory values.

Standard costs are an extension of the normal cost concept. Their increasing acceptance is another indication of the unattainability of true actual costs and of the wisdom of frankly seeking more useful figures rather than vainly following what is but an ideal.

IV. Controllable versus Non-Controllable Costs

Of recent years still another concept has assumed business importance. It is the concept of controllability as opposed to non-controllability. Only a portion of the costs of a given operation are controllable, leaving a balance which is non-controllable. The concept rests upon the dual bases of responsibility and causation.

The element of responsibility in controllability directs attention to the individual whose decisions can conceivably affect the total of a cost item. The costs of a single direct operation or department include three groups of items.

a. Items originating solely in that department.

b. Service items, the use of which is determined by the operation, but the unit cost of which originates solely in another department.

c. Prorated items, the amount and cost of which originate in another department.

The departmental manager or foreman can properly be held responsible only for the items originating solely in his department plus the physical quantities of services bought from other departments. Other parts of his costs and budget are beyond his control —non-controllable. Note that all the items which are for him

non-controllable can be considered the responsibility of the manager of the department in which they arise.

An executive, major or minor, cannot entirely prevent the increase or decrease of even all those items which are directly his responsibility. There are causes which are out of his control. Thus the prices of material and labor are largely determined by economic forces outside the business. Only in those cases where a company is the only (or nearly the only) user or where good purchasing is a factor can the company affect prices paid. Note that even in this case it is the purchasing and not the operating department which can have any effect on prices.

The concept of controllability thus looks to responsibility and causation, and an analysis of costs in terms of this concept will give widely different results from those produced by proration or differential cost analysis.

B. Uses of Cost Concepts

In the previous section there have been considered various cost concepts of interest and practical value to business men. The object of this discussion has not been to accomplish theoretical completeness. It has rather been to present a range of ideas all of which are in everyday use and of importance in arriving at sound business decisions.

Not all of these concepts can be found in the formal cost analyses made in some businesses. It is a rare case, however, where the ideas are not implied in the actual decisions made by the management. Certainly the actual decisions arrived at could not be supported in every case by the analyses prepared in the cost sections of some companies.

It should be unnecessary to point out that the formal accounting routines followed by most companies represent neither all the cost analysis carried on nor necessarily always the most important. Cost routines have always been dominated by the need for financial information. This condition will undoubtedly continue, partly because of the importance of the need, partly because of the obvious requirement for an historical financial record, and partly because many figure needs call for analyses of a transitory rather than of a permanent value.

Both routine procedures and special studies are required in any complete accounting setup. Both fill definite requirements. Unfortunately the air of accuracy and completeness attained by tie-in to the financial accounts has tended to suggest a greater importance for routine figures and for those cost concepts most commonly reflected therein than for the special studies. A very large proportion of the operating decisions made from day to day and of the major policies are based on special studies. It is in these that widely differing cost concepts find their use to meet a wide variety of problems.

A study of the uses of the various concepts naturally starts, then, with a consideration of the types of problems which the common business enterprise meets, and continues with a discussion of the usefulness of the several concepts in those problems. If we base the classification on the possible service of the acounting function in their solution, five groups naturally suggest themselves.

1. Inventory values and profit determination.
2. Sales pricing problems.
3. Current control of operations and investment.
4. Selection from alternatives.
5. Internal audit check.

The last group—internal audit check problem—has definite effect upon cost procedures, but is essentially a problem of the audit phase of financial acounting rather than a problem of cost analysis. Hence it is not germane to the topic under discussion and requires no further consideration. The other four do, and in some detail.

1. Analysis for Inventory Values and Profit Determination

Even those businesses which carry on no formal cost accounting generally appreciate the importance of inventories in profit determination. It is, of course, impossible to determine profit or loss without facts as to the quantity and value of unprocessed, partially processed and finished goods. Enterprises which make no cost analyses must at least estimate the values of such inventories. Modern cost work differs from older methods only in the substitution of relatively accurate procedures for out-and-out guesses. The need for reasonably accurate profit figures makes determination of sound inventory values an always important objective of cost an-

alysis. It dominates the formal cost records and routines and has been an influence towards bad analysis for the reason that its importance has frequently been allowed to overshadow other objectives.

Practically every accounting text gives "cost" as the approved basis for valuing inventories, with provision for recognizing "market" when it is lower than cost. What does "cost" signify? Only an extended discussion could give the answer. I must necesarily assume an understanding of the common routines and analyses by which inventory values are ordinarily determined and limit myself to an interpretation of these in terms of the cost concepts which they reflect. If that approach is taken, it is no overstatement to say that "cost" is a practical mixture of conflicting concepts.

In approving cost as a basis for valuing inventories accountants have sought the objectivity of an investment approach. Fundamentally they have followed outlay. This has worked satisfactorily for material* and for direct labor, but for manufacturing expense actual outlay does not work so well. At that point the concept of "normal costs" has been adopted with the hope that over the long term the results will average the actual financial outlay. In spite of the fact that we all know that it is too much to expect the figures to come out exactly, we have generally concluded that an estimated normal cost is better than a cost based on actual outlay during the current acounting period.

From normal burden it is but a short step to "standard" material and labor charges and to a cost which bears no necessary close relation to current outlay but results from conscious decision that scientifically determined estimates of what cost should be under normal efficiency conditions is more useful than an actual outlay distorted by random factors of price or efficiency.

Even where outlay is presumably followed, there will be instances where write-downs of plant, entirely approved by reputable accountants, will result in modifications of depreciation or depletion charges to new levels which bear no relation to actual outlay. Further, even though there has been a financial disbursement, interest is excluded from cost computations, in spite of the fact that

*In the case of material there is the important problem of deciding what outlay to use: that for the oldest lot on hand; that for the most recent purchase; or an average.

interest paid on borrowed money is an admitted deduction in determining net income.

All this means that even for inventory valuations there is no simple concept which can be used universally with the assurance that it will produce useful results. Instead, while the objectivity of historical outlay is recognized as desirable, that concept is modified without hesitation whenever the resulting figures appear to have greater practical business usefulness.

II. Analysis to Assist in the Formulation of Sound Sales Prices

Cost analysis has yet to come into its rightful position in the formulation of sales price policy. This is due at least in part to a failure to understand the economics of business prices when most manufacturing is carried on with long lines of products produced under joint use of facilities. The railroads represent the extreme of this condition with a multitude of freight items and passengers using to a great extent the same road-bed and terminals. For the railroads the principle of "charging what the traffic will bear" has been accepted from the start, and the idea that every freight charge must bear a relation to a prorated cost has never been seriously advanced.

E. Stuart Freeman has probably contributed as much as any single man to sound thinking in the area of sales pricing. Freeman has used the analogy of a family, pointing out that at any given time in the family of products there are likely to be lusty infants (and some not so lusty), adolescents just coming to full strength, adult wage earners, and oldsters no longer able to contribute their full share, if anything. He makes the important point that there is no more reason to expect every member of the family of products to make the same contribution to family income than there is to have the same expectation in the human family. We don't throw out the baby because he contributes nothing; he is the hope of the family. But, by the same token the adult wage earners must contribute more than a pro-rata share to enable the family to carry on successfully.

The head of the product family must be brutal as compared with his domestic counterpart. There is no place for the laggard product. Unless there is prospect of improvement every member must

contribute something or be cast out. There must be enough high earners to balance the weaker ones in order that there may be a net income left after taking care of the infants.

To do this job well the head of the family—the manager—needs much information. That the problem has not been better met can be laid at least in part at the door of the accountant who has, in many cases obstinately, all too often failed to provide all the information needed. He has built cost figures which are based on long-term normals and on the assumption that equal benefit per unit of time results from use of joint facilities and organization. He has then taken the position that this is the only cost which can be recognized in pricing. Fortunately he stopped at the factory door with his costing, for that gave the manager plenty of leeway to disregard selling and administrative costs without being charged with cutting his price below the mystic "cost" figure.

Sound pricing requires much more information than a normal outlay cost. In the first place recognition must be given to replacement costs. If cost of replacement is above the investment cost of inventories, then it is generally unsound to give away the advantage, for if replacement cost declines it will be impossible to avoid reflecting the decline in price. Further, if a product is in the line, it will be unwise to drop it merely because it cannot be priced with a normal margin so long as it contributes something over and above its differential cost and there is not in sight a more profitable product. Finally, turnover and investment must be recognized by a margin that includes an interest factor reflecting them.

A product priced on the basis of normal prorated manufacturing, selling and administrative costs, plus a reasonable profit, represents a modal or average situation. For every product returning less than that, down to its differential cost, there must be another carrying more than its average share. The manager can accomplish a fair average profit only by a product list ranging from a slight return over differential cost to a high return even in relation to normal prorated costs.

Thus for sound pricing the accountant must provide normal outlay costs, normal replacement costs and differential costs. With these, representing three different cost concepts, the merchandise manager can plan a sound price structure for his business.

III. Analysis to Aid in Current Control of Operation and Investment

One of the really remarkable shifts in accounting emphasis has been from historical records to current control. Much of the daily routine is today directed toward that end.

The demand for accounting data as a basis for control of operations and investment quickly revealed an inherent weakness in the information produced by routine emphasizing the development of costs for inventory purposes. Such costs inevitably included the results of primary and secondary prorations of indirect departments. Increases or decreases in such costs did not necessarily mean a thing as far as the efficiency of direct departments was concerned. From need very quickly developed the concept of controllability. Today no really modern budget plan would try to control costs other than by cost classifications based on this concept.

In this area we have a clear-cut case of a concept developed especially to meet an important business problem, a concept which is of no use for any other objective. It uses a classification based on individual responsibility and functional elements rather than on products.

IV. Analysis to Aid in Choice from Among Alternatives

It is hard to think of a business problem that does not involve a question of alternatives and a selection from among them. The range is from relatively unimportant matters decided by minor executives and even by operatives, salesmen or clerks, to major administrative problems requiring extended study and involving the very existence of the business. There is, on the one hand, the simple problem as to how a particular part shall be made—by hand or by machine, on an automatic or non-automatic piece of equipment. On the other hand, the directors may have to decide whether to purchase a patent which will change the entire manufacturing process or to continue present methods in possible competition with the new process in the hands of another. Every offer of a new piece of equipment involves the same question.

Most of the really minor problems are solved on the basis of the experience or judgment of some individual, without formal analytical study, or upon the basis of some special study and resulting

formula. For others some cost facts will be called for. For the rest a formal study will be required.

All problems of alternatives either compare a proposal with existing conditions or compare two proposals. The inadequacy of an outlay type of analysis is obvious. Examination of the proposals requires estimates of their costs and must be based on estimated prices and either judgment or outside experience as to amounts required. If the comparison is with existing conditions, then an estimate of the savings resulting from dropping the present method is necessary for comparison with the added costs following upon the adoption of the proposed method. The approach is differential in type. Prorations and actual current outlays are irrelevant. The questions are: "How much cost will we eliminate by dropping our present method?" and "How much cost will we add by adopting the proposed method?"

A simple example is the problem of a proposal to drop a branch office. Accounting profit and loss reports, built primarily upon prorated outlay, showed the branch to be unprofitable. An examination of the costs attributed to the branch showed an important part to represent proration of a share of home office sales expense. Further analysis revealed that only a small portion of this could be eliminated if the branch were closed, even assuming all local expenses would cease at once. The portion of prorated cost that would continue was greater than the reported loss. Obviously, closing the branch would only result in a smaller net profit for the enterprise. Differential analysis pointed at once to a solution in which prorated outlay could never help. In areas where the question is fundamentally, "What would be the effect?", differential analysis provides the necessary analytical tool.

Conclusion

It has been the purpose of this discussion to show that the cost concepts and analytical tools available to the accountant are varied and not limited to any single approach. The ever-broadening opportunities open to the accountant present a variety of problems which can be met only by varying the attack. Cost accounting owes its initial development to the need for inventory costs. Today it is a factor in setting sales prices, in controlling operations, and in all important operating decisions. Once it has squarely faced the

problem, it has always been able to develop a cost concept and a technique which will meet the requirements for a solution. The only real danger is that it will become a slave to its own routines and fail to realize that they have validity only to the extent that they serve a business need. The final test of any cost concept is to be found in the purely pragmatic test: "Does it work?" Cost is such a vague general concept that many variations are possible. The many variations each offer individual advantages. In a particular problem we should endeavor to seek the advantages which will help most to a sound solution of the problem. Any concept which does that is a good "cost."

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